

NL 030747

IB/2004/050290

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Anmeldung Nr:
Application no.: 03101919.3 ✓
Demande no:

Anmeldetag:
Date of filing: 27.06.03 ✓
Date de dépôt:

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Bezeichnung der Erfindung/Title of the invention/Titre de l'invention:
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Shaver with flushable hair chamber

In Anspruch genommene Priorität(en) / Priority(ies) claimed /Priorité(s)
revendiquée(s)
Staat/Tag/Aktenzeichen/State/Date/File no./Pays/Date/Numéro de dépôt:

Internationale Patentklassifikation/International Patent Classification/
Classification internationale des brevets:

B26B19/00

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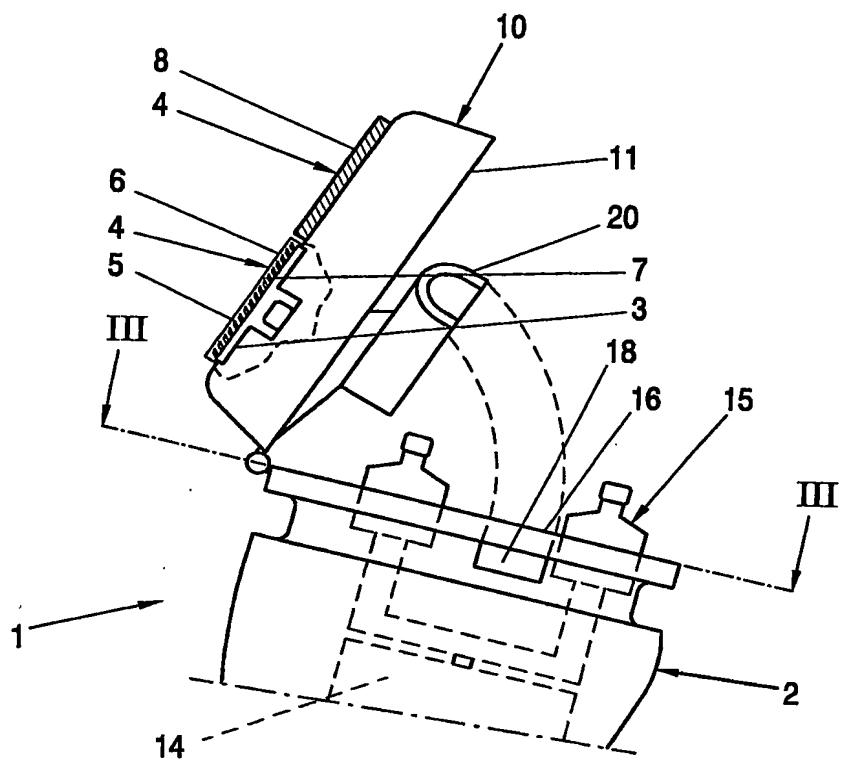


FIG. 1

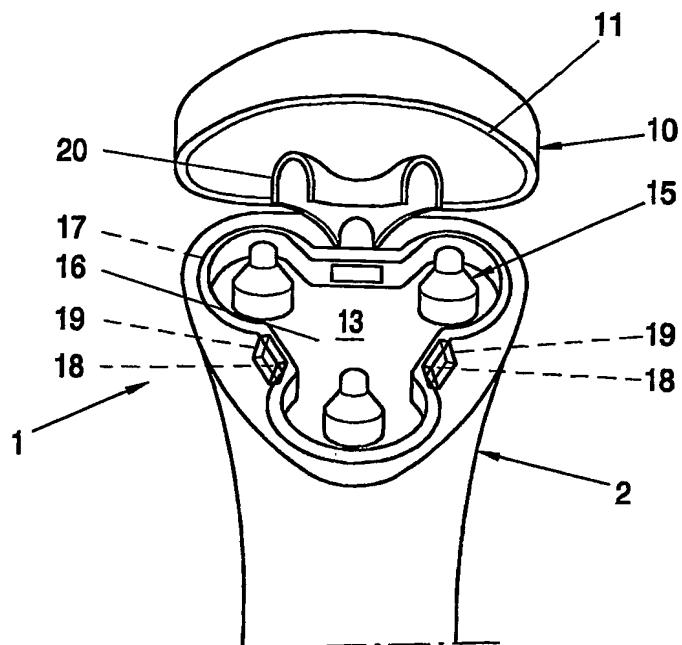


FIG. 2

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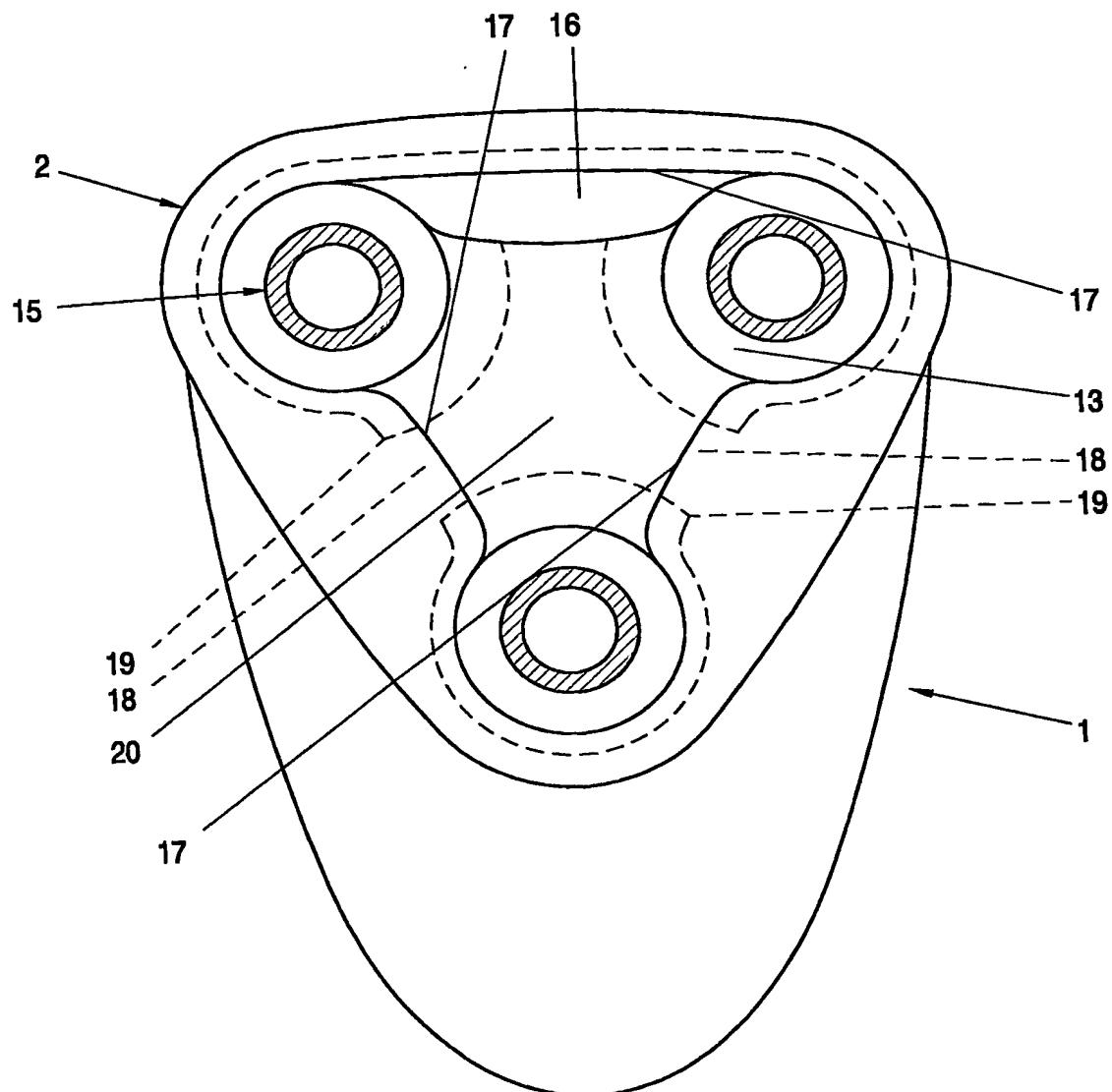


FIG. 3

Shaver with flushable hair chamber

This invention relates to a shaver having a shaving head or shaving heads with a shaving screen including hair receiving openings and a driven cutter or driven cutters co-operating with the openings in the screen for cutting off hairs projecting through the hair receiving openings. Behind the shaving head or heads, a hair chamber is located in which cut off whiskers, hair dust and skin chips accumulate. If the hair chamber is not cleaned regularly, an unhygienic situation is caused which impairs the function of the shaver and sometimes leads to malfunction of the shaver or even damage to the shaver. Such accumulation can and should be avoided by regular cleaning of the hair chamber. Most shavers allow quite easy disassembling of some parts for gaining access to the hair chamber, such as a quick release connection of the shaving head holder to the housing and retainers that retain various parts together when the hair chamber is open and some shavers are waterproof so that the hair chamber can be flushed with water, for instance water running from a tap. However, there is still a desire to further facilitate the cleaning of the hair chamber.

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From the prior art, various shavers are known which include a fan for drawing air through the hair receiving openings. For instance, Japanese patent application 01-97493 discloses a shaver with an impeller for moving air and hair from behind the shaving blade to a dust collecting part where air is exhausted via a filter, U.S. Patent 3,634,935 discloses a shaver with a fan and a centrifugal separator downstream of the fan for separating hair from an airflow arriving from the shaving head, U.S. Patent 3,828,430 discloses a shaver with nets in front of outlet openings to avoid that hair is blown out of the shaver, U.S. Patent 4,031,618 discloses a shaver with a vacuum system for drawing hairs into cutting position and exhausting cut hair from the casing, and U.S. Patent 4,089,110 discloses a shaver with a receptacle communicating with an outlet passage for collecting the cut whiskers.

However, operation of such shavers is either cumbersome, because hair collecting receptacles and filters have to be emptied and cleaned regularly to avoid clogging up of shaving debris therein or soil the environment because whiskers and hair dust etc. are

blown out of the housing over a relatively large area. Moreover, relatively much of the cut hair and skin is left back in the hair chamber.

5 It is an object of the invention to provide a solution for facilitating the cleaning of the hair chamber of a shaver.

According to the invention, this object is achieved by providing a shaver according to claim 1.

10 The flushing port or ports in at least one of the housing portions bounding the hair chamber facilitate flushing shaving debris away by facilitating the flow of water entraining shaving debris through the hair chamber. Because the at least one flushing port in the housing portion bounding the chamber has its outside end at the outside of the housing, a very short flushing port is obtained allowing water to flow in and out of the hair chamber very easily.

15 Particular embodiments of the invention are set forth in the dependent claims. Further aspects, effects and details of the invention appear from the detailed description of an example of a shaver according to the invention shown in the drawings.

20 Fig. 1 is a partially cut-away side view of a top portion of a shaver according to the invention, with a shaving head holder in cleaning position;

Fig. 2 is frontal view of the shaver according to Fig. 1; and

Fig. 3 is a view in cross-section along the line III-III in Fig. 1, but with the shaving head holder in operating position.

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In Figs. 1-3 an example of a shaver 1 according to the invention is shown. This shaver has a housing 2 in which a motorized drive structure 15 including a motor 14 (schematically depicted in Fig. 1) is accommodated. The drive structure is connected to 30 crown-shaped cutters 3 in each of three shaving heads 4. The cutters 3 each have a plurality of cutting edges 5 that are each movable along an inner surface 7 of a screen 6 of the respective shaving head 4. The screen 6 has hair-receiving openings in the form of slits 8. In operation, beard or other hairs projecting through the hair receiving openings 8 are cut off by

the cutting edges 5 of the cutters 3 moving along the inner surfaces 7 of the screens 6 of the shaving heads 4.

5 The shaving heads 4 are suspended in a shaving head holder 10. The shaving head holder 10 is pivotable away from the housing 2 from an operating position against the housing 2 along an edge 11 of the shaving head holder 10 to an open, cleaning position (shown in Figs. 1 and 2) pivoted away from the housing 2. When the shaving head holder 10 is in its operating position, it closes off a hair chamber 13, between, on one side, the shaving head holder 10 and, on the opposite side, the housing portions in the form of a bottom 16 and side walls 17. In its cleaning position, the shaving head holder 10 allows access to the hair 10 chamber 13 for cleaning. It is observed that the shaving head holder 10 may also be suspended to the housing 2 in another manner than pivotably. The shaving head holder 10 may for instance be mounted completely detachably. It is also possible to provide that the shaving head holder is not movable relative to the housing.

15 The housing 2 is waterproof or at least water resistant, so that at least the shaving head side of the shaver can be flushed with water, at least briefly without causing danger or damage to the shaver.

20 The hair chamber 13 communicates with the environment via flushing ports 18 in the sidewalls 17. The flushing ports 18 in the sidewalls 17 each have an outside end 19 at the outside of the housing 2. The flushing ports 18 facilitate flushing by facilitating the flow 25 of water entraining shaving debris through the hair chamber 13. Because the flushing ports have their outside ends 19 at the outside of the housing 2 the ports 18 are very short, allowing water to flow in and out of the hair chamber 13 very easily.

25 A closing member 20 is provided, which is displaceable between a closing position (shown in Fig. 3) for closing off the flushing ports 18 and a flushing position (shown in Figs. 1 and 2) for allowing water to pass through the flushing ports. Closing off the flushing ports 18 provides the advantage that when the shaver is used shaving debris is prevented from falling out of the shaver through the flushing ports 18. This is particularly advantageous when the shaver is used as a dry shaver, i.e. without shaving lotion, which entails that the shaving debris consists of very fine loose particles.

30 The closing member 20 is mounted to the shaving head holder 10 for displacement from the closed position when the shaving head holder 10 is in the operating position to the flushing position when the shaving head holder 10 is in the cleaning position, so that the flushing ports 18 are automatically opened if the shaving head holder 10 is moved away from its operating position.

Because the flushing ports 13 are mounted opposite of each other, water can be flushed straight through the hair chamber 13 or, when the water enters the hair chamber from the side open when the shaving head holder is in its cleaning position, in opposite directions. This is favorable for effective entrainment of shaving debris by the water flushed through the hair chamber 13. For effective and powerful flushing, it is also advantageous if the flushing ports are relatively large, the cross-section of the flushing ports preferably having a smallest dimension of at least 3 mm and preferably of at least 4 mm.

It is observed that within the framework of the present invention many other embodiments are conceivable. For instance, separate closing members may be provided for closing of each flushing port or group of flushing ports. It is also possible to provide that the shaving head holder is not movable away from its operating position. The hair chamber is then flushed either in absence of a closing member or the closing member is displaceable away from the closed position without moving the shaving head holder away from the housing.

CLAIMS:

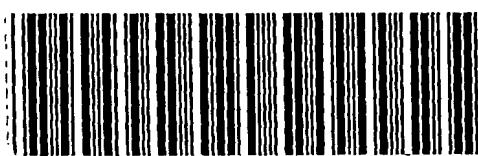
1. A shaver comprising:
 - a housing (2); and
 - a shaving head holder (10) mounted to the housing (2) and carrying at least one shaving head (4) having an external surface for contacting a skin to be shaved and hair receiving openings (8), and at least one cutter (3) movable along the internal surface (7) of the screen (6), the at least one cutter (3) being cooperative with the screen (6) for cutting off hairs projecting through the hair receiving openings (8, 9);
 - a hair chamber (13) being located between the shaving head holder (10) and portions of the housing (2), said portions including a bottom (16) and side walls (17);
 - wherein the hair chamber (13) communicates with the environment via at least one flushing port (18) in at least one of said housing portions (16, 17) bounding the hair chamber (13), said at least one flushing port (18) having an outside end (19) at the outside of said housing (2).
2. A shaver according to claim 1, further comprising at least one closing member (20) displaceable between a closing position for closing off the at least one flushing port (18) and a flushing position for allowing water to pass through the at least one flushing port (18).
3. A shaver according to claim 1 or 2, wherein the shaving head holder (10) is movable from an operating position away from said housing portions (16, 17) for allowing access to the hair chamber (13) for cleaning.
4. A shaver according to claims 2 and 3, wherein the closing member (20) is mounted to the shaving head holder (10) for displacement from the closed position when the shaving head holder (10) is in the operating position to the flushing position when the shaving head holder (10) moved away from the operating position.
5. A shaver according to any one of the preceding claims, wherein at least two of said flushing ports (13) are mounted opposite of each other.

ABSTRACT:

A shaver has a shaving head holder (10) mounted to the housing (2), which is movable between an operating position and a cleaning position. A hair chamber (13) is located between the shaving head holder (10) and housing portions including a bottom (16) and sidewalls (17). The hair chamber (13) communicates with the environment via at least 5 one flushing port (18) in at least one of said housing portions (16, 17) bounding the hair chamber (13). The flushing port (or ports) (18) has (have) an outside end (19) at the outside of the housing (2).

Fig. 2

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